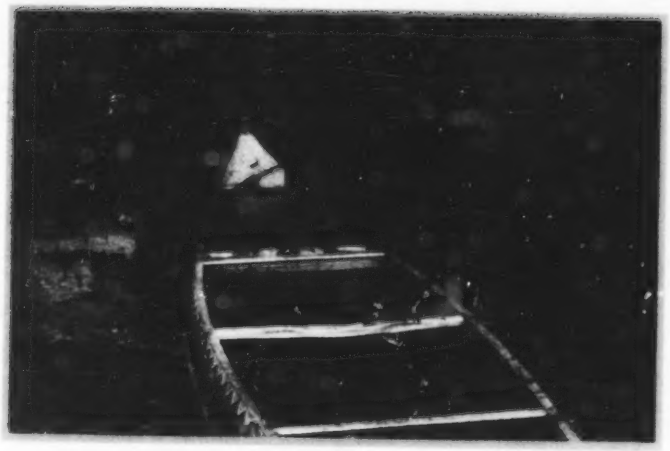
90-06297/

1987-1988 ANNUAL REVIEW

Conservation and Protection Western and Northern Region

Canada

Environment Canada Environnement Canada



Contents

1 Conservation and Protection **2**
- Introduction 2
- Aims and Objectives 4
- Mandate 4
- Jurisdiction 4
- Organization 5
- Conservation and Protection Services 5

2 Environmental Protection **6**
- Introduction 6
- Mandate 7
- Canadian Environmental Protection Act 7
- Environmental Quality Branch 8
- Scientific Programs Branch 9
- Alberta District Office 12
- Saskatchewan District Office 13
- Manitoba District Office 15
- Northwest Territories District Office 17

3 Inland Waters Directorate **20**
- Introduction 20
- Interjurisdictional Water Management 20
- Flood damage Reduction 22
- Water Quality Management 23
- Water Quantity Management 24
- Land Conservation 26
- Toxic Chemicals 26
- Environmental Assessment and Baseline Studies 27

4 Canadian Wildlife Service **29**
- Introduction 29
- Threatened Species 29
- Migratory Bird Studies 33
- Migratory Birds Management 34

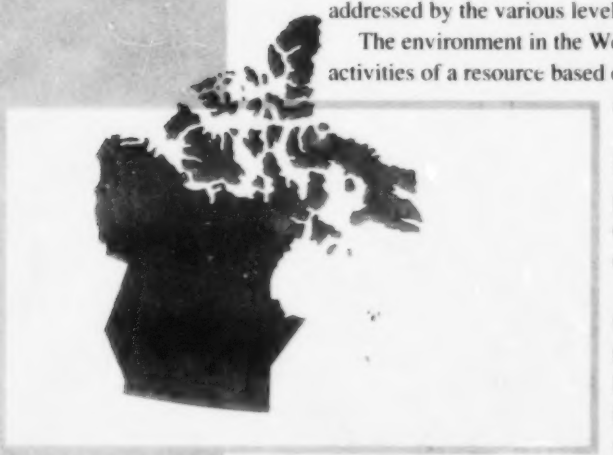
5 Information Telephone Numbers and Addresses **37**

1 Conservation and Protection Western and Northern Region

Introduction

This report describes the organization, mandate and achievements of the Conservation and Protection Service, Environment Canada, Western and Northern Region, for the fiscal year ending March 31, 1988. It has been prepared for the benefit of groups and individuals who have an interest or stake in conserving and protecting the environmental assets of this unique area of Canada.

The Western and Northern Region, comprising Manitoba, Saskatchewan, Alberta and the Northwest Territories, is a vast area totalling more than 5 million sq.km. Its great geographical and economic diversity results in a variety of environmental issues and concerns which must be addressed by the various levels of government, by industry and by the public.



The environment in the Western & Northern Region continues to be affected by the activities of a resource based economy. In spite of progress during the past decade, considerable work remains to be done.

During 1987-88, the energy sector in this region continued its slow recovery, although no major new development projects occurred. We must continue our work in this area to ensure that environmental protection techniques and technology are in place for future development.

The use of chemicals continued as an important economic factor in the financially-troubled agriculture industry, while remaining a potentially significant environmental concern. Extended periods of drought in many parts of the region have increased the pressure on our precious water resources and wetlands. It has not only impacted on the quality and quantity of our water for domestic, municipal, industrial and agricultural uses, but has also resulted in significant reductions in our waterfowl populations and the loss of prime habitat for other species of wildlife.

The continued move towards economic diversification has in turn placed new demands on environmental assessment procedures. Several new pulp mills and food processing industries are prime examples where the integration of economic development and environmental protection interests must occur.

There is, nevertheless, a slow but steady trend toward an improved environment. There has been obvious growth of public concern and action on environmental protection and conservation, a concern which is being felt at all levels of environmental and economic decision making. There is a greater acceptance by industry and governments of the linkage between a healthy environment and a healthy economy and an acceptance of the need for environmentally sustainable economic development.

In this region in 1988 we have seen another increase in the size of the flock of the endangered Whooping Crane; we have seen the reintroduction of the Swift Fox to our prairie environment; we

have seen the release of another herd of endangered Wood Bison to the wild; and we have seen the introduction of a new Canadian Environmental Protection Act intended to provide all Canadians with an equal standard of protection from toxic chemicals. These and many other accomplishments have shown what can be done when governments, agencies, industry and the public work together to address major environmental problems.

Environment Canada does not, and cannot operate alone. Protecting and conserving our environment is a shared responsibility. We depend on the cooperation of governments, private organizations and concerned citizens to develop, and put in place, programs that truly reflect the needs within this vast region of Canada.

B.M. Burns
Director General
Conservation & Protection
Western & Northern Region

Aims and Objectives

Environment Canada was established as a Department of the Government of Canada by an Act of Parliament in 1971. It was given the responsibility of preserving and enhancing the quality of Canada's environment by promoting a harmony between society and the environment, for the greater good of present and future generations of Canadians.

The federal Department of Environment has four major objectives:

1. Influence human activity in order to ensure the well-being of mankind, the diversity of special ecosystems and the lasting use of natural resources.
2. Monitor the conservation of renewable resources (water, land, wildlife) to promote the enhancement and wise use of these resources.
3. Help integrate man's activities into the environment.
4. Safeguard Canada's natural and historic heritage for future generations and encourage Canadians to understand and appreciate this heritage.

The Conservation and Protection Service is primarily involved in Environment Canada's first three objectives.

Mandate

Environment Canada's mandate, as established by the Government Organization Act (1970) includes all matters over which Parliament has authority, not otherwise assigned, relating to:

1. national parks, national historic parks and sites, and heritage canals
2. renewable resources, including migratory birds and wildlife
3. water
4. meteorology
5. preservation and enhancement of the quality of the natural environment, including water, air and soil quality
6. enforcement of rules and regulations arising from the advice of the International Joint Commission relating to boundary water questions arising between the United States and Canada which relate to environmental quality

The Conservation and Protection Service has as its mandate, responsibilities under items 2, 3, 5 and 6.

Environment Canada has primary responsibility for the following legislation: Canada Water Act, Environmental Contaminants Act, Section 33 of the Fisheries Act, National Parks Act, Clean Air Act, Game Export Act, the Ocean Dumping Control Act, Weather Modification Information Act, International Rivers Improvement Act and Migratory Birds Convention Act.

Environment Canada also has special responsibilities concerning the application of policies adopted by the Government of Canada. These include the federal environmental assessment policy under which the Minister of Environment ensures that, during the planning stage, federal departments take into consideration any environmental consequences resulting from their development projects. To this end the Minister has mandated the Federal Environmental Assessment Review Office to administer the process.

Jurisdiction

In Canada, from a constitutional point of view, jurisdiction in environmental matters is divided between the federal and provincial governments.

The provinces are responsible for the direct administration of most matters relating to the environment and resources within their boundaries. The federal government is responsible for matters of national interest ie. the Northwest Territories and Yukon, national parks, oceans, and a number of resources such as fisheries, imports and exports, in addition to areas that cannot readily be handled by the provinces ie. meteorological services, environmental data gathering, research, etc.

It is important to note however that the environment knows no political boundaries, and any given human activity may impinge upon areas covered by both federal and provincial jurisdiction.

Therefore substantial cooperation between both levels of government is required on many environmental programs and issues. In the Western and Northern Region, Conservation and Protection shares jurisdiction with the Provinces of Alberta, Saskatchewan and Manitoba, and the Northwest Territories.

Organization

Environment Canada's activities are grouped into three main program areas: The Atmospheric Environment Service, the Conservation and Protection Service and the Canadian Parks Service. The Atmospheric Environment Service provides information on weather, climate, sea-state, ice conditions and air quality, while the Canadian Parks Service establishes, develops and manages national parks and historic parks and sites across the country.

Conservation and Protection Service

The Conservation and Protection Service of Environment Canada is made up of three sub-groups, including the Canadian Wildlife Service, the Environmental Protection Service and the Inland Waters Directorate. The Conservation and Protection Service has been assigned two primary roles within the responsibilities of Environment Canada:

1. The conservation of renewable resources, which involves long-term renewable resource management (water resources development, water quality and quantity research, assessment of impacts of federal programs and operation of a national land data bank), conservation and protection of migratory birds and research to improve wildlife management techniques.
2. The protection and enhancement of environmental quality, which involves working, either directly or with others, to anticipate and prevent threats to environmental quality resulting from human activity, and to correct environmental problems caused by such activity. There is also the responsibility for programs to promote good environmental practices in such areas as hazardous waste disposal, chemical use in industry, environmental impact assessment and environmental emergencies.

The Conservation and Protection Service is divided into five administrative regions across Canada (Atlantic, Quebec, Ontario, Western and Northern, Pacific and Yukon); with the Western and Northern Region having responsibility for Manitoba, Saskatchewan, Alberta and the Northwest Territories. In the Western & Northern Region the regional headquarters of Conservation and Protection is located in Edmonton.

The Regional Director General of Conservation and Protection has the job of coordinating the efforts and activities of the three sub-groups (Environmental Protection, Wildlife and Inland Waters) to achieve the conservation and protection objectives of the Service. The Regional Director General also develops the corporate programs of the Conservation and Protection Service in the Region and serves as the Co-chairman of the Committee of Regional Executives (CORE).

2 Environmental Protection

Introduction

The Environmental Protection Service of Conservation & Protection is the control arm of Environment Canada on environmental protection matters. It works on issues as diverse as air pollution, water pollution, waste management, toxics and hazardous substances and environmental emergencies on federal lands or having impact on federal jurisdiction.

These responsibilities can include involvement in such areas as agricultural and forestry pesticides, toxic chemicals such as PCBs, automobile emissions, emissions from smelters, pulp and paper mills, mines, oil refineries and other industry sectors, ocean dumping and water pollution. Environmental Protection will also be responsible for the implementation and enforcement of the new Canadian Environmental Protection Act (CEPA).

In the Western and Northern Region, Environmental Protection has its regional headquarters in Edmonton and District Offices in Winnipeg, Regina, Edmonton and Yellowknife and sub-district offices in Inuvik and Iqaluit, N.W.T.

The EP organization in Western and Northern Region reflects three main activity areas: policy/strategy, knowledge base, and program delivery. These are described below, as well as in later sections dealing with each branch and district office.

The **Environmental Quality Branch** (EQB), located in the regional headquarters office in Edmonton, is responsible for coordinating regional compliance and enforcement, environmental impact assessment, waste management and environmental emergency programs. It defines and projects regional policies and strategies, and determines and coordinates response requirements to demands made on the region from outside sources. During 1987-88, EQB played a major role regarding regional contributions toward the development of CEPA and its policy on compliance and enforcement.

The **Scientific Programs Branch** (SPB) is also located in the regional headquarters office in Edmonton. It is responsible for developing, obtaining, interpreting, and managing a regional knowledge base. This Branch contains scientific and engineering expertise necessary to lead and assist regional staff. Scientific Programs Branch also operates the regional EP analytical laboratories, and data storage and retrieval systems; and it manages certain special funding for research and development in the Western and Northern Region (e.g. Panel on Energy Research and Development (PERD)).

The four **District Offices** of EP in this Region are responsible for delivery of regional EP programs in their respective provinces and territory, and for interfacing with provincial, territorial and other federal agencies. In the Northwest Territories, there are also sub-district offices at Inuvik and Iqaluit, which report to the Northwest Territories District Office in Yellowknife.

Mandate

Within the context of the mandate of Environment Canada, Environmental Protection (EP) is responsible for addressing the following needs:

- prevent, reduce or eliminate the adverse impacts of new developments;
- prevent, reduce or eliminate releases of pollutants that cause losses;
- contain or restrict hazardous substances that are necessary to society;
- clean up materials that cause environmental damage;
- provide the public access to environmental information; and,
- achieve environmental protection objectives in a cost-effective manner.

For 1987-88, some of the regional priorities of Environmental Protection were: toxic chemicals management (including development of the new Canadian Environmental Protection Act and related policy and consultation work), Economy and the Environment (especially regarding agricultural practices), waste management (with special consideration of environmental health on Indian Reserves), rigorous application of regulations, and support to the environmental assessment requirements of federal agencies.

Canadian Environmental Protection Act

Since the initial announcement of this new federal legislation and the tabling of a draft Bill in December 1986, the Act has undergone an extensive consultative review and numerous changes have been made as a result of submissions from industrial groups, provincial and territorial agencies and the general public. As a culmination of this consultation process, Bill C-74 was tabled for the First Reading in the House of Commons on June 26, 1987. After Second Reading of the Bill, which concluded on October 23, 1987, the Parliamentary Review Committee heard witnesses, received submissions and carried out a thorough clause-by-clause review, during the course of which 142 out of 244 proposed changes were approved and adopted. The revised Bill C-74 is expected to undergo Third Reading in the House of Commons in late April 1988, with promulgation to take place by the summer of 1988.

The Act is intended to ensure the appropriate management of toxic chemicals from "cradle to grave". It places emphasis on the assessment of new chemicals prior to their introduction into Canadian society, new controls on the releases of toxic chemicals in emergency situations including mandatory reporting of releases, the ordering of recalls of chemicals and clean-ups by the Minister of the Environment, the requirements for industry to notify DOE of restricted chemicals, and other new measures.

The Act replaces the existing Clean Air Act, Environmental Contaminants Act, Canada Water Act (Part III), Ocean Dumping Control Act and the Department of the Environment Act (Section 6(2)). The Act does not consolidate all federal legislation related to the protection of the environment, such as the Pest Control Products Act, Fisheries Act (Section 33), or the Transportation of Dangerous Goods Act.

The new Act gives the Minister of the Environment powers to establish regulations, guidelines and objectives for the protection of the environment and contains new stiffer penalty provisions for violations of regulations.

The Department has developed an Enforcement and Compliance Policy to accompany the Act to provide for rigorous but fair enforcement of the provisions of the Act. The draft policy was subject to a nation-wide public consultation with industry and environmental groups. The final policy will be issued when the new law is proclaimed.

Environmental Quality Branch

The Environmental Quality Branch (EQB) is located in the regional office in Edmonton. Its mandate is to develop strategies and objectives for preventing and correcting environmental degradation in the region and to provide leadership and support in operational delivery by the District Offices. EQB also assists clients in private industry, OFGDs, the provincial/territorial governments and the general public in the delivery of strategies and objectives developed to prevent and correct environmental degradation.

The major program areas for EQB are: (A) **environmental impact assessment** of new federal initiatives (such as proposals for projects, policies, and programs); (B) **enforcement and compliance** of environmental protection legislation and/or regulations for existing federal and industrial facilities; (C) **waste management** programs for toxic and hazardous substances; (D) **environmental emergency** response; and, (E) **public consultation** and communications.

A. Environmental Assessment

During the past year EQB:

1) Completed and distributed an annual report on the Regional Screening and Coordinating Committee's activities, and coordinated EP input to selected reviews of major projects by serving on Regional technical sub-committees such as the Hydropower sub-committee (Oldman River Dam Project in Alberta), Dredging sub-committee (Lake Winnipeg Mainte nance Dredging program), and Transportation sub-committee (Regina Rail Relocation).
2) Provided technical and administrative support to District Offices and Scientific Program Branch in the environmental assessment of pulpmills and Parks projects in Alberta, Shand Thermal Generation Station in Saskatchewan, Public Works Canada (PWC) Maintenance Dredging in Manitoba, Gulf Canada's Beaufort Sea Amauligak project and National Defence's North Warning System in the N.W.T.
3) Provided the lead for the Department in the review of the Department of National Defence proposal to establish a new low-level flight training route in a corridor crossing the southern NWT/northern Alberta and northern Saskatchewan.

   EQB also initiated coordination of Regional input to a national Transport Canada review of the use and disposal of de-icing fluids at all Class-A airports across Canada (including Calgary, Edmonton and Winnipeg).

B. Enforcement and Compliance

The Environmental Quality Branch coordinated regional aspects of national compliance and enforcement initiatives and provided advice and guidance on policies, legislation, regulations, guidelines and codes of good practice dealing with industrial pollution control and federal activities.

EQB involvement in the new Canadian Environmental Protection Act included the development of a C&P regional Implementation Framework, participation in the drafting of the companion Enforcement and Compliance Policy, attendance at a workshop held by the Alberta Environmental Law Centre to review the Policy, a review of provincial regulatory equivalency to the bill, organization and participation in a training session for regional inspectors and management.

Support was also provided to the drafting of the joint DOE/Department of Fisheries & Oceans Fisheries Act Enforcement and Compliance Policy and a review of the Canadian Petroleum Association's Code of Good Practice.

C. Waste Management

Support was provided in the successful staging of the 9th Annual Waste Management Conference held in Edmonton in October.

The waste reduction program for small businesses continued to be successful. During the past year a three-day waste management course for the Metal Finishing Industry was held in Edmonton in November. Attendance totalled 33 from all 4 western provinces. This course, together with waste assessments at two metal finishing plants in Calgary, resulted in several metal finishing plants adopting some of the less costly recommendations for waste reduction.

Significant amounts of hazardous wastes are generated at many federal establishments in the Region. EQB assisted the district offices with waste audits at federal facilities and in formulating waste management plans for these facilities (for example: CFB Cold Lake, CFB Edmonton).

A regional directory of waste handlers, recyclers and disposal facilities was produced and distributed for use by federal departments.

D. Environmental Emergencies

Support was provided in staging the 10th annual Arctic Marine Oilspill Program (AMOP) seminar held in Edmonton in June 1987. Over 100 participants from five countries reviewed the progress of research and development related to arctic and marine oil spill prevention and response measures.

E. Public Consultation and Communications

EQB coordinated the regional consultation for the new Canadian Environmental Protection Act, including meetings with provincial/territorial officials, industry representatives and environmental organizations to explain provisions of the Act and to consult on the draft Enforcement and Compliance Policy.

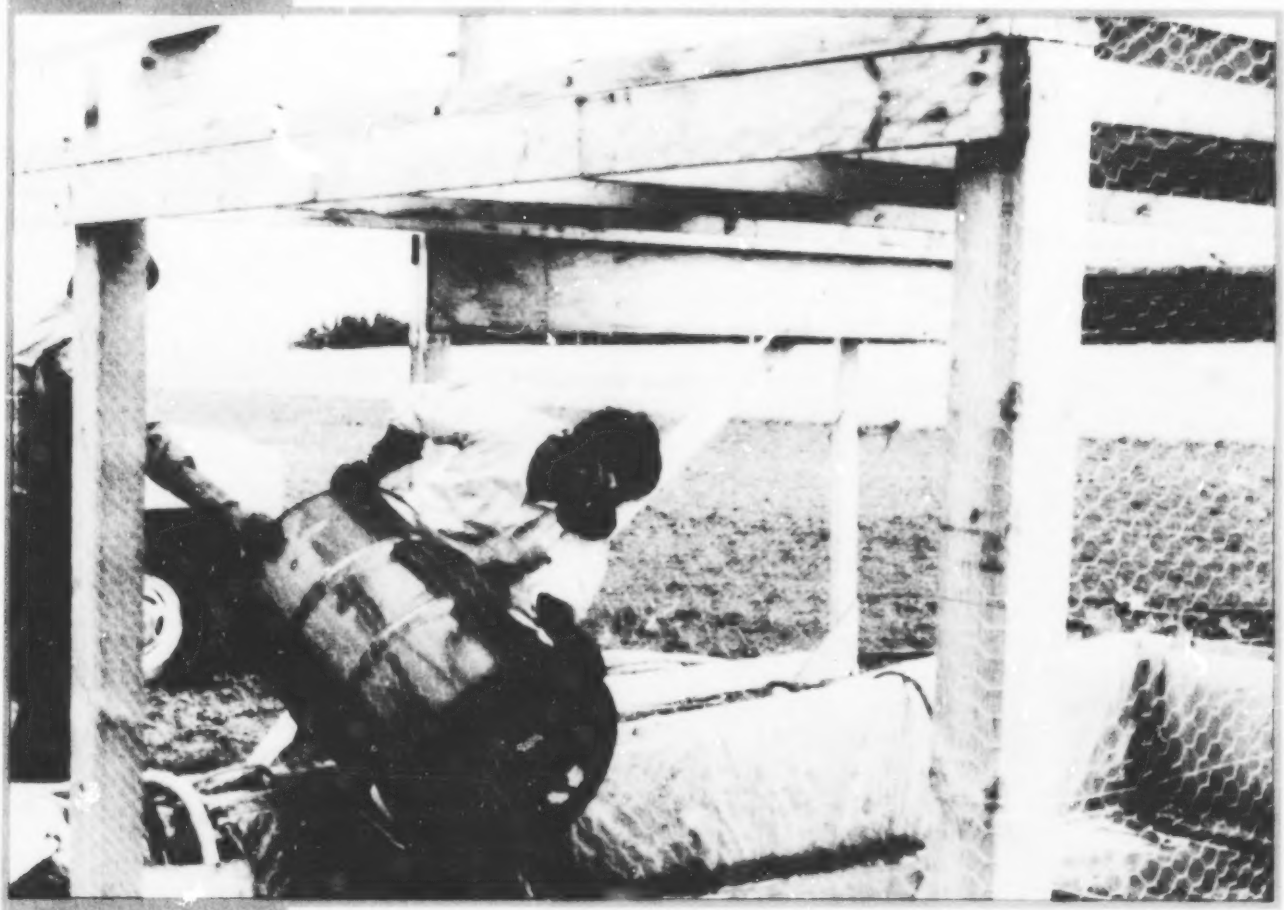
Scientific Programs Branch

Scientific Programs Branch (SPB), located in Edmonton, is responsible for developing, obtaining, interpreting, managing and transferring technical and scientific knowledge in the region. A wide range of subjects is addressed annually, including assessments of industrial control technology and commercial chemical usage.

Environmental Assessments

The Scientific Programs Branch represented EP on three technical review sub-committees: Tar Sands and Heavy Oil, Hydrocarbon and Mining. Chairmanships of the Tar Sands and Heavy Oil, as well as the Regional Mining Committee (North of 60°), were also provided.

Coordination of EP technical input to reviews of new initiatives included such projects as the



Environmental Impact Assessments of the Champion Pulp Mill expansion, Daishowa Pulp Mill proposal, Cigar Lake Test Mine, and the Collins Bay A-Zone, D-Zone, and Eagle Point developments. In addition, SPB contributed to EP N.W.T. interventions to the N.W.T. Water Board for the Terra Mines/Bullmoose Lake Gold Mine Project, Neptune Resources Corp./Colon gold Mine Project and Borealis Exploration gold Mine Project.

Energy – Panel on Energy Research and Development (PERD)

Scientific Programs Branch receives funding from the Interdepartment Panel on Energy Research and Development to administer environmental studies associated with energy developments. Ongoing programs focus on conventional oil and gas, and heavy-oil/oil sands developments. The funds are used to accelerate the development of pollution abatement technology, identification and assessment of new environmental concerns, and technology transfer. All research activities are coordinated with industry, provincial environmental and regulatory agencies, and other federal departments.

During 1987/88, contracts were let for the following PERD-funded studies:

- Assessment of the Taciuk processor for treatment and recycling of conventional and heavy oil production wastes;
- Review and assessment of current flaring technology;
- A survey of flaring practices in Alberta;
- Feasibility study to determine the possible impact on the subsurface environment of future bitumen recovery at the Alberta Oil Sands Technology Research Authority's (AOSTRA) underground test facility.

Pesticide Re-Evaluation

Scientific Programs Branch (SPB) operates a program to re-evaluate the environmental information available on (registered) pesticides currently in use. The aim is to identify pesticides that require additional environmental testing to ensure they meet modern standards. This information is transferred to Agriculture Canada who deals with the manufacturers. The pesticide chemicals which were assessed during 87/88 were MCPA, carbaryl and creosote.

Pesticide Assessment Projects

SPB continues to support and administer applied research projects investigating the environmental fate and effects of pesticides used in the region. A number of PESTFUND-assisted projects were conducted in 1987/88 to address the impacts of grasshopper spraying on non-target organisms. Four other environmental research projects are ongoing. Included are projects investigating the following:

- the effects of the pesticide lindane on daphnia at levels found in many prairie rivers;
- the impact of the grasshopper pesticide carbofuran on prairie sloughs;
- the fate and effects of the herbicide bromozynil on wetland habitats;
- the levels of pesticides in prairie atmospheric samples.

Communications

In 1987/88, two additions to the popular series of Pesticide Chemical Factsheets and three brochures on household hazardous wastes were prepared. These latter brochures define hazardous wastes, discuss common disposal methods, and provide household users of hazardous chemicals with disposal options and alternatives to the less environmentally safe products.

Laboratories

The laboratories for EP Western and Northern Region are located in Edmonton. They include three sections: Inorganic Chemistry, Organic Chemistry and Ecotoxicity, all of which work in an

integrated manner to provide definitive analysis and advice on the environmental effects of samples received from the regional scientists and engineers.

During 1987-88 approximately 1500 samples were analyzed for a broad range of parameters. Some of the industrial sectors monitored include uranium mining, refineries, meat and poultry processing, and metal mining. With the emphasis on toxic chemicals, several projects dealing with pesticides and their effect on the environment provided environmental samples for biotesting and identification. Samples of transformer oil were analyzed for PCB content in early 1988, in connection with a violation of regulations under the Environmental Contaminants Act.

Alberta District Office

Alberta District Office (ADO), based in Edmonton, is the operational component of Environmental Protection (EP) in Alberta.

Environmental Assessment

Under the Canada-Alberta sub-agreement on environmental assessment, ADO led federal inter-departmental review of major development projects in Alberta, such as the proposed Weldwood and Daishowa pulp mill projects.

Federal Activities

A major water quality survey was designed and implemented during the Olympic Games, to ensure optimum operation of the Banff sewage treatment facility during a period of high loading and low river flow. ADO continued to provide technical advice on the design of a new sewage treatment facility for Banff, and participated in the development of wastewater guidelines for other federal facilities.

The results of a study examining the feasibility of using wetlands as a natural means of improving wastewater quality at remote facilities were presented at an international symposium. This should have applicability on Indian Reserves. A further report detailing the status of wastewater treatment on Indian Reserves in Alberta will be used in developing a comprehensive action plan for remedial measures and in the planning of new facilities.

Partly as a result of ongoing work by ADO with Transport Canada, a highly successful environmental management plan at Calgary International Airport will be duplicated at all major Canadian airports, including the establishment of Pollution Control Officers.

Toxic Chemicals Management

Alberta District maintains an inventory of PCB-containing equipment in Alberta. In 1987/88, this inventory was used in respect to emergency situations such as the Edmonton tornado and a major fire at an oil sands upgrading facility, and in connection with new provincial legislation requiring movement of these materials from storage to destruction.

A draft Hazardous Materials Management Plan for Canadian Forces Base Edmonton was completed and has received acceptance within DND as a possible model for national use.

A User's Guide on environmentally sound vegetation management was developed in consultation with the Industrial Vegetation Management Association of Alberta. The Guide will be distributed to regional vegetation managers at federal and other facilities.

Two hundred gas stations were monitored, in order to ensure compliance with the leaded gasoline requirements of the Clean Air Act. Only one was found to be out of compliance.

Energy/Environment Research and Development

In 1987/88, ADO managed the second phase of a consultant study to evaluate filtration as an option for recycling oil sands tailings pond water.

Public Information

Alberta District Office developed new public information material, including the initiation of a video for elementary schools, which projects the Sustainable Development and Environment/ Economy themes. The film will be promoted in Alberta schools during the 1988/89 school year. Information sessions were held at public events during National Wildlife Week and Environment Week, and presentations were given to Edmonton area schools.

Environmental Emergencies

Alberta District responded to a number of environmental emergencies of federal concern, such as a spill of sodium dichromate from a railway engine in Banff National Park, in which ADO provided on-scene direction on clean-up and collected evidence to be used in any resulting litigation.

Saskatchewan District Office

The Saskatchewan District Office (SDO), located in Regina, has active programs in the areas of agriculture, uranium and energy, and participates in the enviornmental assessments of new economic initiatives with federal interests.

Efforts are primarily directed to the priority areas of toxic chemicals, enforcement of regulations under various federal acts and technology development and demonstrations.

Environmental Assessment

Environmental Protection ensures that comments from Environment Canada on proposed major developments are considered in the Saskatchewan Environmental Assessment and Review Process. The majority of the reviews related to mining developments where the emphasis is to ensure the impact on the environment of the mine is minimized during and after its operational life. Other reviews included the Shand Thermal Power Generating Station and a number of small federally sponsored projects.

Uranium Development

Saskatchewan produces 23 percent of the western world's uranium from three mines. Environmental advice on matters relating to uranium mining is given to the Atomic Energy Control Board and leads to environmental protection provisions in federal licenses. Federal regulations under the Fisheries Act are also included in the licenses. For the three active mines, conceptual decommissioning plans are being developed with the other regulatory agencies, including Saskatchewan Environment. This will allow radioactive tailings to be effectively contained without continual upkeep upon completion of the operating phase of the mines.

In addition to the active mines, three test mines are planned or under construction. In providing advice on the test mines, emphasis was placed on preventive environmental measures.

A major research program to study radionuclides in vegetation has been completed. The study analyzed plants near the uranium mines and in more remote areas in northern Saskatchewan and in the Northwest Territories. Abandoned uranium tailings in Lake Athabasca have also been studied for their impact on aquatic life.

Enforcement of Regulations

One investigation was carried out under the Environmental Contaminants Act, with an information being laid for allegedly selling PCBs in contravention of the PCB product regulations. The charge was dismissed and the case is presently being appealed.

Heavy Oil

An Environment Canada-Agriculture Canada project on heavy oil waste was developed, with an objective being to provide an alternate waste management option for the oil industry. Using heavy oil waste as a resource, the material is applied to sandy soil to prevent wind erosion. The project has shown that heavy oil waste does assist in increasing soil aggregation, without detrimental effects on the crop, when the oil is applied at one to two percent.

Post-Registration Monitoring of Pesticides

In conjunction with Agriculture Canada, EP conducted a study on the movement of pesticides by spring runoff, by air transport and by movement to the ground water, in a small watershed north of Regina. It was shown that air movement through the volatilization of pesticides, and wind erosion of soil containing pesticides, are mechanisms for transport of pesticides to non-target areas. The major herbicides studied were 2,4-D, MCPA, dicamba, triallate, trifluralin, diclofop-methyl and bromoxynil.

Technology Demonstrations

Technologies which have proved successful elsewhere are being demonstrated under Saskatchewan conditions. By proving their success under local conditions, the technologies can benefit both the Saskatchewan environment and economy.

- Sewage sludge from Regina is being applied to agricultural land close to the sewage treatment plant. The intent of the demonstration is to show land application of sewage sludge being of benefit to both the city and the farmer.
- The crushing of used pesticide containers throughout Saskatchewan leads to the collection of a large quantity of dilute pesticides. A pit was constructed containing alternating layers of porous material to treat the residues. The treatment of the residues in Saskatchewan will solve a toxic waste problem locally and save money previously used for disposal costs.

Manitoba District Office

The Manitoba District Office, located in Winnipeg, enforces certain federal regulations at selected pulp mills, food processing plants and secondary lead smelters.

Environmental Assessment

Environmental Protection, in cooperation with Public Works Canada (PWC), conducted an assessment of heavy metal concentrations in samples of dredging soils from Lake Winnipeg at the mouth of the Red River. Only background levels were detected. A report is in progress. The aim of the project is to provide PWC with predictive tools to minimize environmental impact and to conduct post dredging monitoring.

Petroleum Product Storage and Handling

An inventory and inspection of petroleum product storage and handling facilities and procedures at federal facilities in southern Manitoba were completed to assess compliance with Manitoba Regulation 97/88R. Most tank systems were out of compliance with the regulation, with the frequency of non-compliance typically more than 30 percent. Owners of these systems were requested to undertake corrective actions. Compliance will be monitored next year.

Automobile Emissions

Retail gasoline outlets in urban and rural Manitoba were tested for compliance with the Leaded and Lead-free Gasoline Regulations under the Clean Air Act. A gasoline pump nozzle switching survey was also undertaken in conjunction with this program. None of the 103 samples collected violated the regulations. In Winnipeg, 16 percent of the outlets versus 32 percent in rural Manitoba had at least one leaded gasoline pump fitted with a small nozzle indicating that, while the practise is declining, misfueling is still a continuing problem in Manitoba.

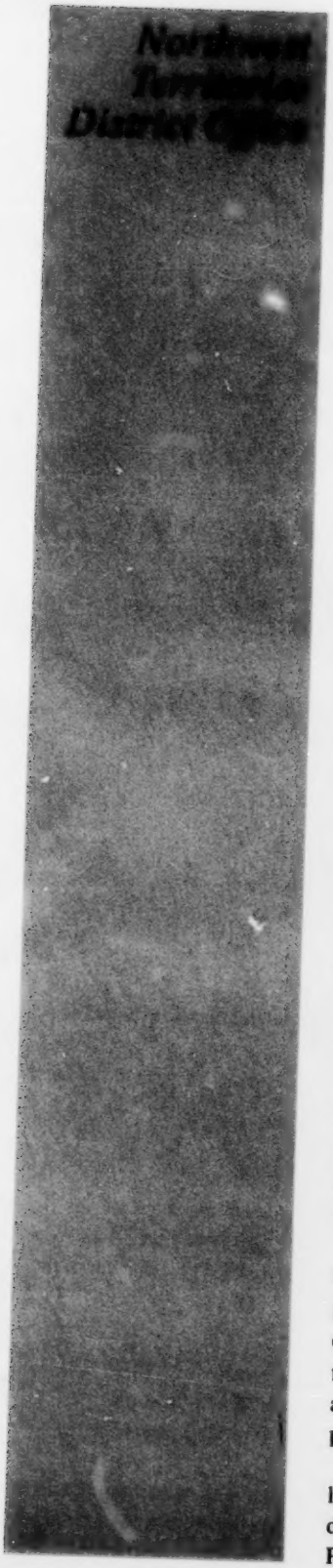
In June, a voluntary vehicle emission test clinic was conducted in Brandon to gather information on emission levels of hydrocarbons and carbon monoxide from in-use motor vehicles. Inspections were also carried out to determine the extent of tampering with emission control systems. Emissions from the majority of the 244 vehicles tested were found to be within Environment Canada's suggested exhaust emission limits.

Environmental Education

EP has participated on an Environmental Education Review Committee (EERC) since 1985. The EERC objective is to promote greater emphasis on environmental education in the public school system. A report was completed for EP and the EERC in 1987 which surveyed leading stakeholders to determine if a public mandate exists for environmental education in the curriculum and to identify areas of public concern in order to formulate objectives and identify curriculum content. This report and two others by the EERC formed the basis for a brief on environmental education submitted to the provincial Ministers of Environment and Education in January 1988.

Public Awareness

In January 1988, EP promoted the use of sustainable agricultural practises at agricultural "Weed Fairs" held in Brandon and Winnipeg. The overall theme presented was "A Healthy Environment – The Key to Economic Success". EP also promoted the safe use and alternatives to using toxic chemicals in the home at a Home Expressions Show held in Winnipeg in March, 1988.



The Northwest Territories District Office in Yellowknife is responsible for the delivery of EP programs throughout the N.W.T.. Sub-Offices are maintained in Inuvik and Iqaluit. Because the vast majority of land in the N.W.T. is still administered by the federal government, EP has a significant and direct role to play in most northern development issues.

Environmental Assessment Programs

EP reviewed Initial Environmental Evaluations in 1987/88 for the North Warning System and Low Level Flights (DND), and for Gulf Canada's proposed Amauligak Extended Flow Test (DIAND). Detailed advice on information and monitoring requirements were provided to the initiating departments.

EP continued to coordinate the Norman Wells Research and Monitoring Program, a joint government/industry program designed to evaluate the environmental implications of the Norman Wells pipeline and oilfield expansion projects. A report of all research and monitoring projects is prepared annually.

Environmental Quality Programs

Draft guidelines for monitoring Beaufort Sea sediment quality were produced with the assistance of other government departments, industry, and consultants through a workshop to achieve consensus on specific critical points.

Three research programs were continued under funding by the Northern Oil and Gas Action Program. Baseline sediment quality data around the Amauligak F-24 wellsite was collected for use in refining long-term monitoring programs and for comparison with future monitoring data to assess trends in sediment quality. A project to assess sub-lethal effects of contaminant inputs on biota in Tuktoyaktuk Harbour was completed. A project examining the pathways of hydrocarbon contaminants in the Mackenzie River in relation to the Norman Wells oilfield and refinery was also completed.

Support was provided to the Technical Advisory Committee of the Northwest Territories Water Board on water licence terms and conditions for six mining operations and one oil refinery. Support was also provided to DIAND's Arctic Waters Advisory Committee and to COGLA's Canadian Environmental Committee on Petroleum Activities on the environmental aspects of Gulf Canada's drilling and flow testing program at the Amauligak field in the Beaufort Sea.

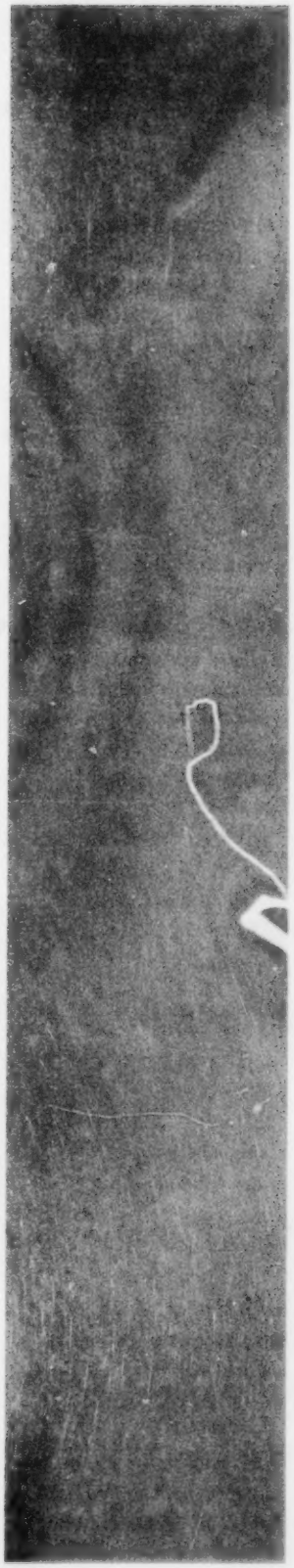
Enforcement Programs

Several enforcement and compliance programs were completed, including verification of PCB inventories in the N.W.T., investigations of oil spills at federal facilities, and gasoline sampling for lead-in-gasoline compliance testing. A legal investigation, under the authority of the Ocean Dumping Control Act, was completed and Gulf Canada was convicted on eight charges for dumping waste barite and cement into the Beaufort Sea without an ocean dumping permit. A fine totalling $180,000 was levied.

Ocean Dumping Programs

EP established Regional Ocean Dumping Advisory Committees in Inuvik and Iqaluit. Both Committees include representation from federal and territorial government agencies as well as from regional and native organizations. The Committees will consolidate advice on specific permit applications and, in the case of the Inuvik Committee, provide liaison with Inuvialuit review processes.

Two Ocean Dumping Control Act permits were issued during 1987/88: one for the use of low-level radioactive carbon in Resolute Bay by Department of Fisheries and Oceans; and one for the disposal of 60 tons of scrap metal through the ice near Ellef Ringnes Island, in the high Arctic, by Panarctic Oil Ltd.



Waste Management Programs

One training session was held in Iqaluit in 1987/88 on the identification and handling of PCB-containing equipment and PCB liquid.

EP continues to provide advice to DIAND on the cleanup of hazardous wastes at abandoned DEW Line sites. In 1987/88, remaining priority sites were identified.

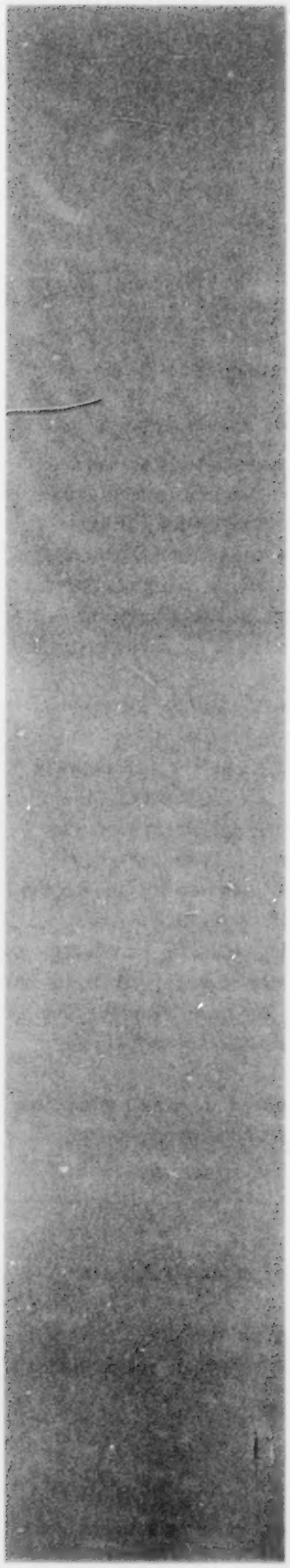
Toxic Chemicals Programs

EP continued as a member of the GNWT review committee for pesticide licence applications in the NWT. Three applications were reviewed for mosquito and black fly control programs in Yellowknife, Hay River, and Fort Simpson. One application was reviewed for pest control in the Prince of Wales Northern Heritage Centre, Yellowknife.

Spill Prevention and Response Programs

Draft contingency planning guidelines have been prepared for government and industry operators. On release, these guidelines will provide a common standard for spill preparedness throughout the North.

Guidelines for the construction and operation of bulk fuel storage facilities in northern Canada were prepared by EP in cooperation with the GNWT. EP also developed an inspection form and conducted inspections in several communities in 1987. The inspection program will eventually be



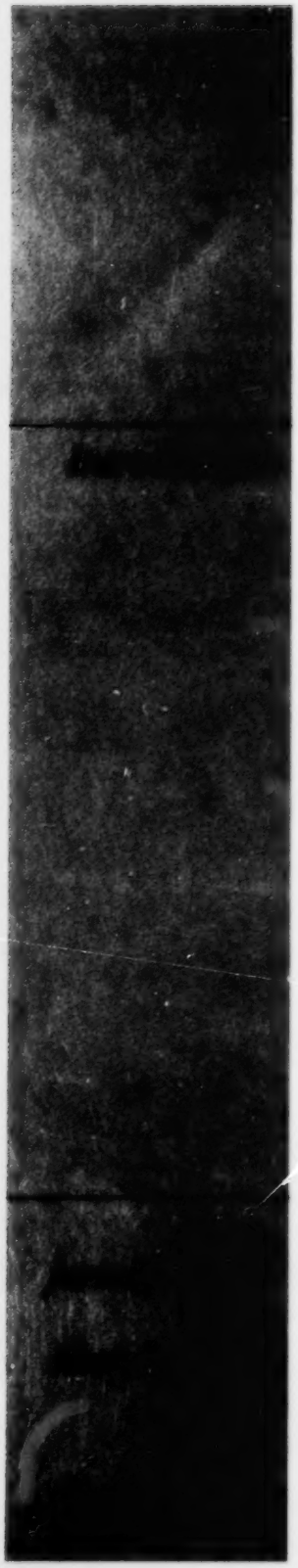
extended to include all communities, industries, and government operators in the NWT.

A modular training course was developed by EP to provide industry, government, and the public with an understanding of the basic principles of hazardous material spill prevention and response. One course was presented to the Environmental Technology Program at Arctic College in Iqaluit.

The Environmental Atlas for Beaufort Sea Oil Spill Response, completed in 1987, attracted worldwide interest and acclaim. All available copies of the atlas have been distributed. In 1988, EP plans to have the Atlas reprinted and sold through a publisher.

Federal Facilities Programs

Federal facilities were inspected in four communities in the N.W.T. Operational deficiencies and potential environmental problems were identified and recommendations for remedial measures were directed to the operators.



3 Inland Waters Directorate

The Inland Waters Directorate of Conservation & Protection has the responsibility to plan and conduct federal, federal-provincial, inter-provincial and international water management programs and policies; to carry out research and gather data related to the quality and quantity of inland waters; and to monitor the aquatic environment to evaluate regulatory actions. The Directorate works closely with provincial and U.S. water management agencies to ensure that water development and use on either side of the border is not detrimental to downstream jurisdictions. In addition, Inland Waters carries out river basin planning and flood damage reduction programs in cooperation with the provincial governments.

As part of its program the Inland Waters Directorate maintains a network of approximately 1400 stations across the Western and Northern Region to measure and record water flows and levels. This network is part of the national Water Survey of Canada data system which is operated under cost-sharing agreements with the provincial and territorial governments. The water quality monitoring network consists of 70 stations across the Region and information collected is used in water quality assessment.

In the Western and Northern Region the Inland Waters Directorate has regional headquarters in Regina and the main branch offices in Calgary, Yellowknife and Winnipeg. The Directorate has field offices at nine other locations in the Region.

The National Hydrology Research Centre in Saskatoon, is the federal government's main water research institute in Western Canada. Major areas of research include ground water, northern hydrology and aquatic biology.

Program Objective:

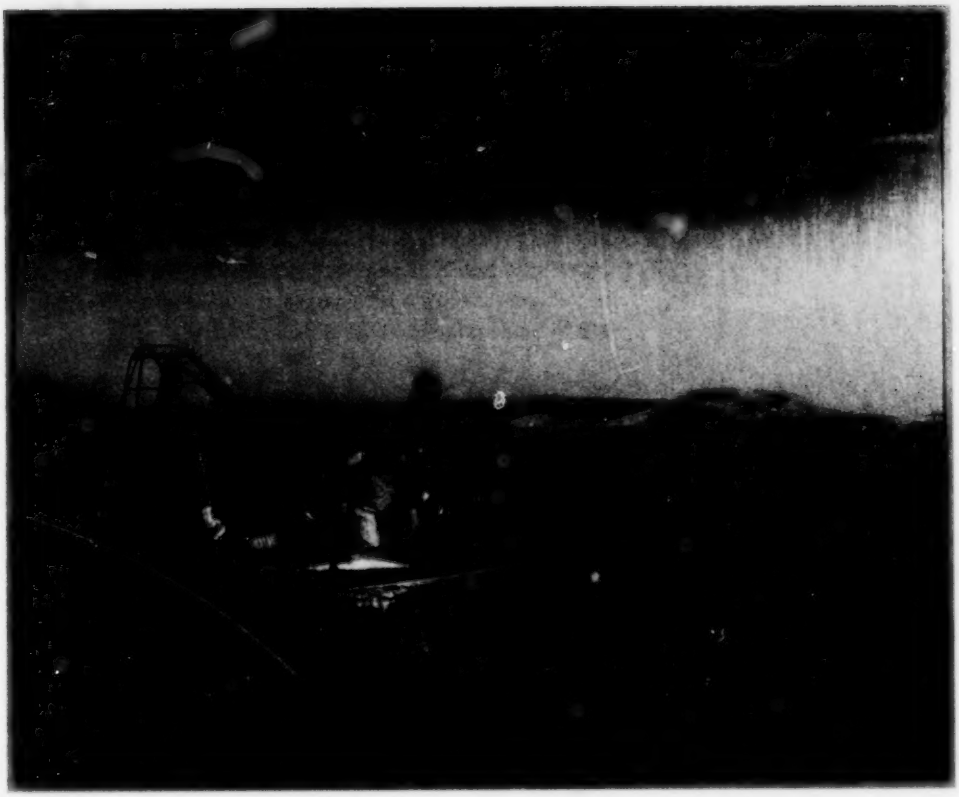
To resolve interjurisdictional water resource problems and realize interjurisdictional water resource opportunities in accordance with the national interest.

The Western and Northern Region has 6000 km of provincial/territorial boundaries and 1650 km of shared boundary with the United States of America. In addition it encompasses thousands of kilometres of coast line in the Arctic and Northwest Territories.

Achievements:

International Boards and Committees

The Inland Waters Directorate participates on 11 boards or committees, under the auspices of the International Joint Commission, to protect Canada's interests on waters which cross the Canada-



United States boundary. In support of these international agencies data is collected on water quantity and quality for all major rivers or streams crossing the border. Technical analysis and advice was provided on Red River water quality, the U.S. Garrison Diversion project, flooding potential from dyking along the Red River in North Dakota, Poplar River water quantity and quality, apportionment of flow on the St. Marys, Milk, Frenchman and Souris Rivers, and Battle and Lodge Creeks.

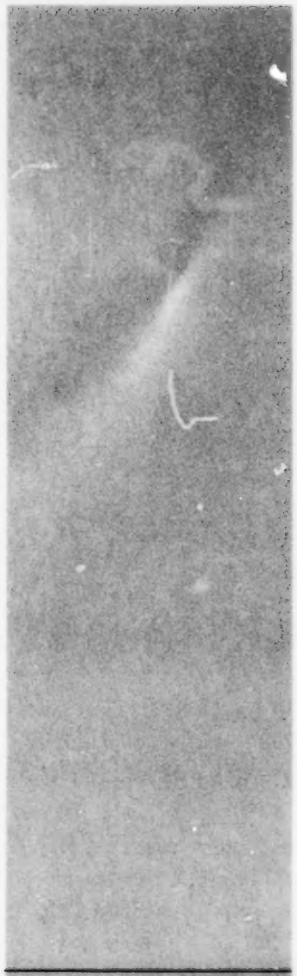
Mackenzie River Basin

The Mackenzie River Basin Committee was established by the governments of Canada, British Columbia, Alberta and Saskatchewan in 1977. The committee is charged with: exchanging information on water and related resource activities and intended developments in the Mackenzie River Basin; determining the need for studies and carrying out approved studies and making recommendations on the implementation recommendation of the 1981 Mackenzie River Basin Study Report. Towards this end bilateral discussions between Alberta and British Columbia, Alberta and Northwest Territories have been initiated to reach an agreement on the management of transboundary water issues.

South Saskatchewan River Basin Study

The objective of the South Saskatchewan River Basin Study is to develop a framework plan to guide the long term management of water resources in the basin.

During the past year inventories of water uses in the basin have been completed on irrigation and municipal use. This will provide the basis to apply water use, water quality and water balance models, to develop and evaluate water management alternatives over the next two years. A water balance model to evaluate the impact of different development scenarios was completed.



Drought

Generally below normal snow accumulations and above normal temperatures during the 1986-87 winter coupled with less than normal spring precipitation combined to generate below normal streamflows in the prairies. Normal precipitation and temperatures during the summer did not relieve the water supply shortages.

The 1987-88 fall and winter was warm and dry over most of the prairie provinces. Spring runoff was below normal except in the northern half of Saskatchewan. Rural and small community water supply shortages were evident throughout the Palliser Triangle by late March, 1988. Late season snowfalls in the mountains had improved water supply forecasts for streams originating off the Alberta eastern slopes. One major impact of the drought was hydro-power production shortfalls by some utilities on the prairies.

Qu-Appelle River Conveyance

On June 27, 1984, a five year Canada- Saskatchewan Agreement on Qu-Appelle River Conveyance was signed. The $4.75 million, cost sharing agreement provides for the completion of the channel improvement work begun under the 1974 to 1984 Qu-Appelle Implementation Agreement. During 1987-88 a total of $1,036,100 was spent, predominantly on the completion of channel improvements, spoil pile levelling, grassing, and clean up in the Highway #6 to Pasqua Lake reach of the river. By the end of the 1987-88 fiscal year the total expenditure under the agreement is $3,425,882.

Manitoba Northern Flood Agreement

The agreement, signed by Canada, Manitoba, Manitoba Hydro and the Northern Flood Committee (comprised of five Manitoba Indian Bands) permitted the development of the Nelson River hydroelectric power projects. Environment Canada and Fisheries and Oceans Canada are involved in determining the environmental impacts of the diversion of the Churchill River and the regulation of Lake Winnipeg.

During the past year work continued on monitoring the adverse impacts on waterfowl, water quality, sediment regime, morphology and mercury contamination, in response to Claim Number 18 filed under the Northern Flood Agreement.

Flood Damage Reduction (FDR

Program Objective:

To reduce future flood damage and federal disaster assistance payments. The Inland Waters Directorate has developed a program which is jointly funded with provincial or territorial governments, with federal funding provided through the provisions of the Canada Water Act. Agreements are developed to address hydrology and hydraulic studies, flood risk mapping, special studies, flood forecasting and flood mitigation projects.

Achievements:

Manitoba

The Flood Damage Reduction Program in Manitoba is implemented through the following agreements: General Agreement Mapping Studies, Flood Forecasting and Flood Mitigation Projects Agreement.

The Agreement Respecting Flood Risk Mapping expired March 31, 1988 ($2.4 million). Flood risk zones have been designated for 16 of the 24 targeted communities (including Winnipeg and Brandon), representing over 62% of Manitoba population. The communities of Arbourg, Fisher Branch and Riverton were designated during 1987-88.

Under the Agreement respecting Studies for FDR flood mitigation alternatives were examined for 12 communities ($310,000).

The Agreement Respecting Flood Forecasting was extended to September 30, 1989 with

$400,000 in additional funding (total $1 million). An upgraded Canada-Manitoba Flood Forecasting Centre is now in operation. A Telidon weather radar system was developed in co-operation with Environment Canada's Atmospheric Environment Service to generate data for the Flood Forecasting Centre. A public information brochure on flood forecasting was prepared and distributed.

Under the Flood Protection Projects Agreement, the upgrading of ring dykes have been completed at six of the eight communities originally targeted. An authorization has been obtained by the United States Corps of Engineers to complete the works at the U.S.A. portion of Emerson. Public hearings (conducted by Manitoba) were held to consider local opinion on the proposed Ste. Rose du Lac project.

Saskatchewan

Three FDR agreements are current in Saskatchewan: (i) General Agreement, (ii) Mapping and Studies Agreement, and (iii) Floodplain Management Measures Agreement. Work this year was confined to completing the public information maps of Melfort and Radvil to be designated in 1988-89.

Alberta

A draft Canada-Alberta Flood Risk Mapping Agreement was completed. A six-year, $5.5 million agreement would use existing mapping of 19 communities and would require new flood risk mapping for 33 communities.

Northwest Territories

The termination dates of the General Agreement and the Memorandum of Understanding were extended to March 31, 1993. Nine communities have been designated including Fort Liard, Nahanni Butte, Fort Norman and Tuktoyaktuk designated during 1987-88. This completes the mapping and designation program in the Northwest Territories.

Indian Reserves Mapping: Manitoba

Two pilot projects initiated in 1985 have now been completed. Project outputs include (i) hydrology reports, (ii) hydraulic reports, and (iii) 1:2000 scale flood risk maps for Lizard Point and Sioux Valley Indian Reserves.

Indian Reserves Mapping: Saskatchewan

Discussions were held with Indian and Northern Affairs Canada and Red Earth Band to conduct a historical flood study of the Red Earth Indian reserve.

Water Quality Management

Program Objective:

To ensure that present and future generations of water managers and Canadians have sufficient reliable, compatable and timely water quality data and information on Canada's water environment. Water quality data and information are required for the effective management and conservation of Canada's inland waters.

The increasing importance of ground water supplies on the prairies has resulted in a need to evaluate and identify potential pollution problems of these aquifers, many of which are interjurisdictional.

Achievements:

Data Collection and Dissemination

- The Water Quality Branch (WQB) operates a National Water Quality Assessment Network and a Regional Network consisting of over 50 stations in the Prairie Provinces and over 20 in the Northwest Territories.

- Analytical laboratories include portable field labs, the WQB regional lab in Saskatoon, and the WQB National Lab in Burlington.
- Data is collated on a computer in Regina, verified and immediately sent as sample reports to the appropriate agencies.
- Quarterly updates are sent to the National Aquatic Data Base (NAQUADAT) in Ottawa where they are available to a broad audience.
- All Regional results are annually released as a data report.

Surveys and Special Studies

Studies and surveys were undertaken for limited but specific purposes related to such water quality assessment aspects as:

- sampling technology for sediments, water and biota.
- development of a water quality objective-based management plan for a selected area in northern Manitoba.
- forage fish as indicators of biological stress and aquatic health.
- water quality in national parks eg. Elk Island and Prince Albert, towards the development of water quality management plans.

Monitoring Agreements and Arrangements

Water quality monitoring agreements with federal and provincial/territorial agencies are pursued by the WQB to maximize effectiveness of activities through:

- reduced duplication and the cost-sharing of activities of mutual interest
- joint design of surveys and studies
- joint interpretation and report preparation

In addition to the above, the long term federal – provincial/ territorial agreements provide all parties access to nationally consistent data from a large network of stations. Eight Agreements and Arrangements were active in 1987-88. Negotiations for comprehensive water quality monitoring agreements with Saskatchewan, Manitoba and N.W.T. were conducted during 1987-88 and are anticipated to be finalized during 1988-89.

Water Quantity Management

Program Objective:

To provide comprehensive, accurate and timely data and information on the quantity of Canada's inland waters. This program provides the information base of water quantity and sediment data needed for the assessment, planning, design and operation of water based projects; the apportionment of interjurisdictional waters; the management of fish and wildlife habitat; the assignment of water rights and licences; the development of hydroelectric energy; the protection of the public right of navigation and recreation; and the assessment of climate change.

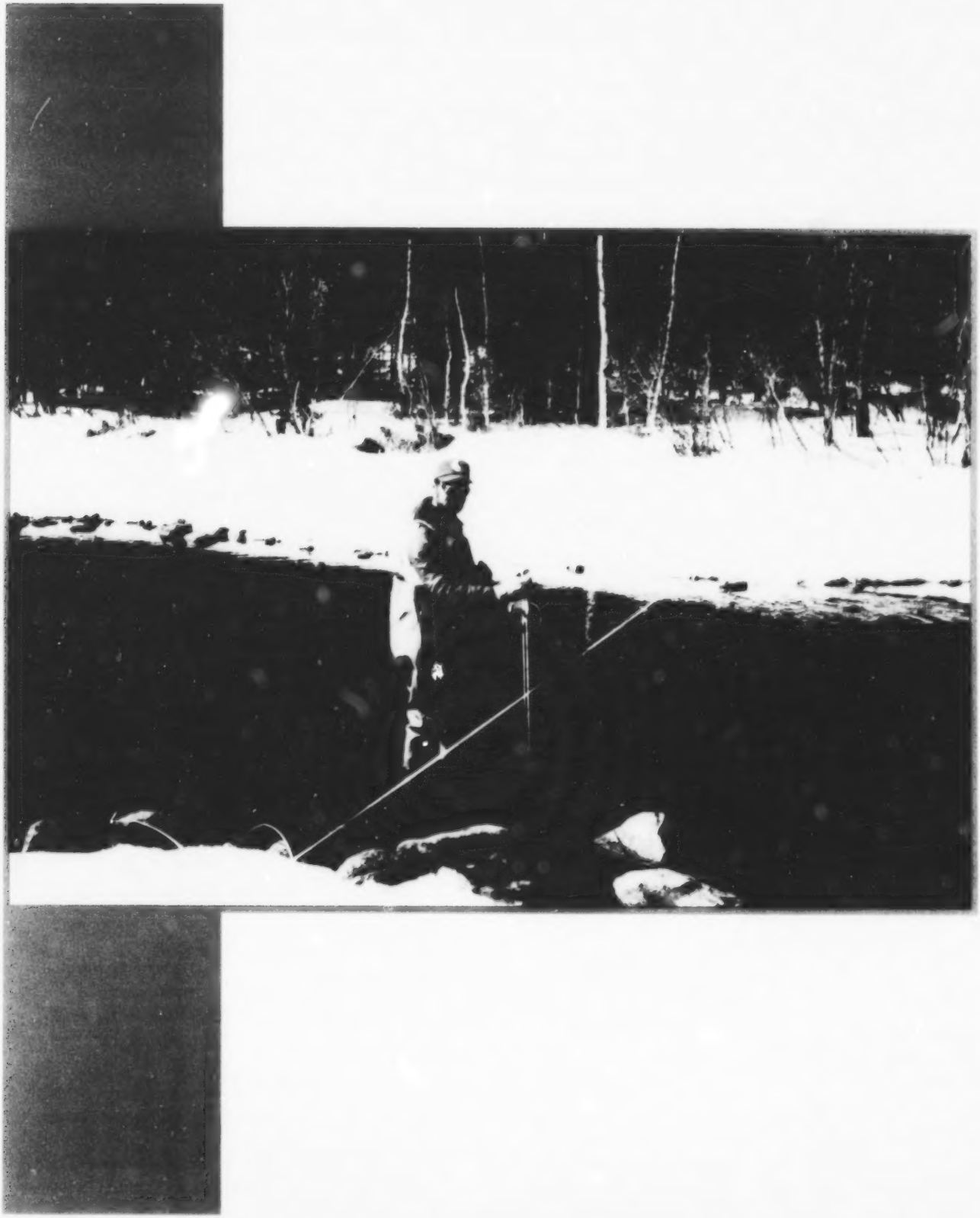
Achievements:

Flood Forecasting

Provided current streamflow and water level data, information and advice to flow forecast centres in Alberta, Saskatchewan, Manitoba and Northwest Territories. This information was used to mitigate the impact of floods and droughts and ensure sustained levels for hydropower generation and navigation.

Federal-Provincial Data Collection

Maintained co-operative data and information gathering systems with the provinces of Alberta, Saskatchewan and Manitoba and the Northwest Territories to help understand and manage the long term impact of climate change, water diversions, wetland conservation as well as in the



design of civil engineering works such as dams, flood protection dykes, diversion canals, bridges and river crossing. Under this cooperative program water level and discharge data at some 1480 locations and sediment data at over 100 locations were added to the national water resources data base (HYDAT).

Information Services

Made presentations on water resources to 500 students and at several regional and national conferences. As well, over 1800 requests for data, information and advice by the Canadian public were answered.

Data Users

Provided real-time water level and stream flow data to the major hydro power companies as well as information to support the fisheries and recreational industries in the three prairie provinces and the Northwest Territories. Manitoba-Hydro was brought in to the planning and management of the water resource gathering system under the Canadian-Manitoba Memorandum of Agreement on Water Quantity Surveys.

Sediment Activities

Several sediment issue workshops were sponsored by WRB to assess user needs as well as to market the sediment program.

Land Conservation

Program Objective:

To provide the government, land managers, and the public, with scientifically valid information, analysis and solutions to alleviate nationally significant threats to the sustained use and quality of Canada's land resource, and to address the role of land in the achievement of national economic and environmental goals.

The Lands program provid comprehensive national and regional data bases on land capability, quality, use and changes in use and quality. With the aid of a computer information system, this data base is combined with other socio-economic and environmental information and applied to priority environmental issues including degradation of prime lands for waterfowl, agriculture and forestry; relationship between the environment and the economy; sustainable economic development; and impact of climate change on land capability.

Achievements:

Urban Land Use

Area screening studies for Calgary and Edmonton were completed to document land use changes in these urban centres. A report on land use in the city of Saskatoon was released.

Prairie Land Use Changes

Studies were conducted to document the extent of waterfowl habitat loss, the conversion of prime forest land to other uses, the targeting of soil and water conservation programs and the application of computer based geographical information systems to resource planning and management.

Toxic Chemicals

Program Objective:

To provide information on the presence of toxic chemicals in the environment, the pathways of these chemicals through ecosystems and knowledge of the actual and potential impacts on the environment.

Since both surface and ground water supplies are affected by toxic chemicals, data and knowledge about the distribution and movements of chemicals in the hydrologic regime and the assessment of their effects on aquatic ecosystems are prerequisites to any effective control strategy.

Priority is given to monitoring and analyzing the distributions of pesticides and organic compounds such as PAH's and organochlorines and to studying the movements of water-carrying radionuclides and other toxics.

Achievements:

Toxics in Regional Waters

The program examines trace elements, industrial chemicals and pesticides. A five year Pesticide Action Plan was developed which allows the program to reflect changing use patterns. A new group of widely used herbicides was added to the Branch parameter list in 1987 and analytical procedures were examined for bromoxynil and glyphosate.

Presence and Abundance

Toxic chemicals including metals, PCBs and pesticides are found in water, sediment and biota throughout the Region. Samples from mountain streams and precipitation showed that some toxic chemicals are ubiquitous eg. lindane and alpha-BHC indicating the long range transport of toxic chemicals.

Long range transport of toxic chemicals from agricultural and industrial areas of the world is further implicated by a research study on deposition of organic contaminant in the Arctic. This study has shown that snow from various locations in the Arctic and samples from the Arctic icecap were contaminated with low levels of pesticides (lindane) and other organic compounds such as toxaphene.

An investigation into the presence of hydrocarbons in the Mackenzie River was conducted. A report is under preparation.

Surveys of raw drinking water supplies carried out cooperatively with Agriculture Canada and the Saskatchewan and Manitoba provincial environment departments showed that most water supplies were free of herbicides at the time of sampling. However, a few were found to have very low levels of 2,4-D, trifluralin and atrazine.

Effects

The environmental significance of low levels of toxic chemical in aquatic samples remains a source of uncertainty. Biological studies to assess acute and chronic toxicity of samples were conducted to address this uncertainty. Through biological screening it is possible to direct future investigation to areas, samples or periods of greater concern. A number of studies have been undertaken:

- multi-jurisdictional study on the Red River characterized the toxicity of effluent and surface water samples from the headwaters to Lake Winnipeg.
- bioassay procedures were used on surveys in the Saskatchewan River Basin, in the Northern Flood Agreement area and at selected sites in southern Manitoba.

Environmental Assessment and Baseline Studies

Program Objective:

To participate effectively in the Environmental Assessment and Review Process and to provide environmental knowledge and predictive capability which will ensure that federal decisions on major development proposals reflect environmental and renewable resource concerns.

Achievements:

The Inland Waters Directorate conducted extensive reviews of a number of new dams either proposed or under construction. The Oldman River Dam in Alberta is being constructed by the province and the environmental impacts of the project were assessed and advice provided to Indian and Northern Affairs Canada on possible impacts on downstream Indian Reserves. Alberta also released a number of consultant reports on the proposed Milk River Dam which were re-

viewed to assess the environmental impacts and any potential impacts on flows of the Milk River across the Canada-U.S. border.

The Rafferty Dam project on the Souris River in Saskatchewan was assessed to determine the impact on water quality, waterfowl habitat and flows downstream into the U.S. and Manitoba. Extensive consultations have also taken place to ensure that Canadian interests are protected in the issuing of an International River Improvement Act licence.

4 Canadian Wildlife Service

Introduction

The Canadian Wildlife Service (CWS) of Conservation and Protection is responsible for the protection and management of migratory birds through the development and enforcement of regulations, habitat management, research and surveys. As well, the Wildlife Service, in cooperation with provincial and territorial governments, carries out programs of research and management related to wildlife where there is a national interest ie. endangered species.

The Wildlife Service carries out specific wildlife research and advises other federal agencies on wildlife matters. It represents Canada in negotiating and managing international agreements and programs on wildlife conservation.

In the Western & Northern Region the Wildlife Service activities concentrate on migratory birds and their habitat, especially waterfowl populations and the preservation of habitat. In the area of other species, specific work is conducted on Whooping Cranes, Peregrine Falcons, Wood Bison, Swift Foxes, Peary Caribou, Muskoxen, Trumpeter Swans, among others.

The Canadian Wildlife Service in Western and Northern Region has its regional office in Edmonton, with branch offices in Winnipeg and Yellowknife and the Prairie Migratory Bird Research Centre located in Saskatoon.

Threatened Species

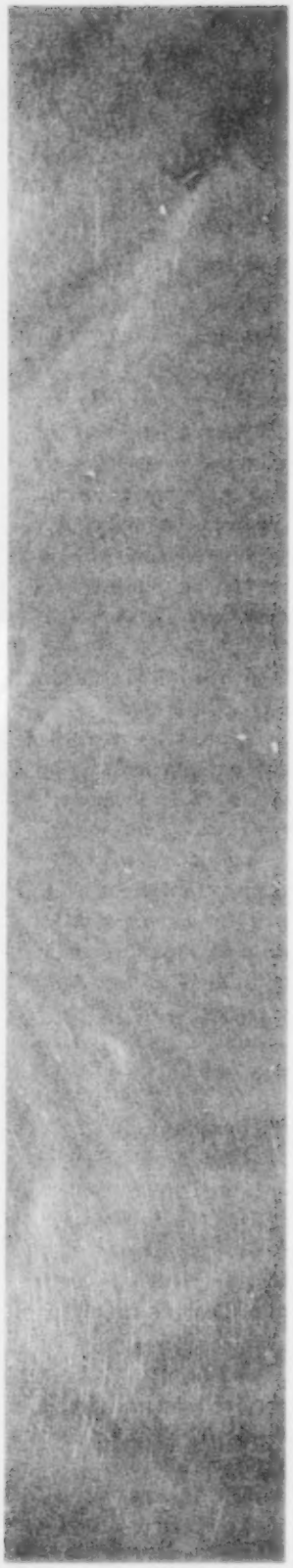
Whooping Cranes

As part of the continuing effort to protect and conserve the endangered Whooping Crane, CWS carried out aerial surveys in 1987 to monitor cranes and their nests in and near Wood Buffalo National Park. At least 32 nests are known to have been constructed in 1986. Twenty-four surplus eggs were removed, leaving at least 34 eggs in the Park. Twenty-seven chicks are known to have hatched and of these, 25 survived their first migration to arrive at the wintering grounds in Texas.

The population now contains about 77 (58%) colour-banded individuals, including 17 adults, 39 subadults and 21 juveniles. Survival of the subadult birds has been excellent and several new breeding pairs are anticipated in 1988.

Of the 24 surplus eggs removed from Wood Buffalo National Park, 12 live eggs were placed in nests of Greater Sandhill Cranes at the Grays Lake National Wildlife Refuge in Idaho, USA, as part of a cooperative USA-Canada management program. Although all eggs hatched, an extremely serious drought took a heavy toll of Whooping Crane chicks and only two survived.

All 7 live eggs shipped to the Patuxent Research Centre in Maryland, USA, hatched but two of the seven chicks eventually died. The remaining birds will be used for captive propagation purposes.



As of January 1988, the world population of Whooping Cranes numbered about 194 birds. Of these, about 132 are in the Wood Buffalo-Texas population, about 20 in the Grays Lake population and abo[illegible]3 are in captivity.

Piping Plovers

A field study was initiated in 1987 in Alberta to look at aspects of Piping Plover biology. Sixty-four plovers were colour-banded and reports of banded birds have come in from the Gulf of Mexico coastal areas. Piping Plover breeding habitat was surveyed in Alberta, Saskatchewan, Manitoba and Ontario, while wintering habitat was visited in Texas and Mexico. A five-year Piping Plover research and conservation proposal was drafted.

Peary Caribou

Systematic aerial surveys were carried out in July 1987 to determine the status of Peary Caribou and muskoxen on Melville and Byam Martin Islands, Northwest Territories. Coverage of the survey was 27%. Total numbers of caribou and muskoxen were estimated at about 943 and 5652 on Melville and 98 and 100 on Byam Martin, respectively. Caribou calves represented 19.4% of all caribou seen on Melville and 18.9% of all caribou seen on Byam Martin. Muskox calves represented 15.2% of all muskoxen seen on Melville but only 2.9% of all muskoxen seen on Byam Martin.

Muskoxen have increased within the 1987 two-island survey area by about 140% since 1974. Unfortunately, Peary caribou have continued to decline markedly within the 1987 survey area, by about a further 39% since 1974 and an overall 92% since 1961. The number of Peary Caribou summering within the 1987 survey area would not safely support any significant level of annual harvest especially if it involved breeding age females.

Peregrine Falcons

In June 1987, the national wildlife directors approved the anatum Peregrine Falcon Recovery Plan with a goal "to enhance the wild anatum population in Canada to a numerical and production level where it is no longer considered endangered or threatened". The National Recovery Team met in December in Saskatoon to review the issues that limit the recovery of the falcon. A major recommendation was for more intensive sampling of peregrine falcon prey and eggshells to determine the effects of toxic chemicals.

Monitoring toxic chemical residues in the prey of Peregrine Falcons was conducted in the autumn in Mexico as part of the Latin American Program. Eight avian migrant species were collected in Mexico along with samples of native fish and oysters, for chemical analyses. As well, more recent samples were collected by local cooperators in spring, 1988. All samples will be analyzed for organchlorines and other residues.

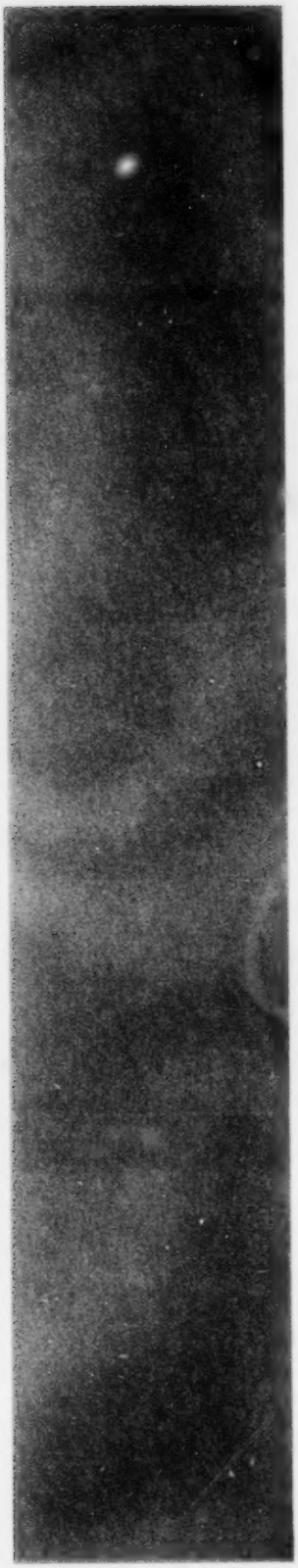
In support of their recovery efforts, the Wainwright, Alberta, captive breeding facility produced 79 young falcons from 28 breeding pairs in 1987. Four young were held back as future beeders and 75 were released at nine sites in six provinces by cooperating provincial and federal agencies.

Swift Foxes

A total of 109 Swift Foxes, half equiped with radio-collars, were released in southern Alberta and Saskatchewan in late 1987. Fifty-seven of these foxes were released using the direct release method, while the remainder were foxes released from pens where [illegible]ey had been held at the release sites for some time. A survey in April, 1988, located at least 13 radio-collared foxes in dens, while an additional two, without collars, were seen above ground.

Polar Bears

The final report from three years of field work to reevaluate the population of Polar Bears in the Beaufort Sea was completed in March 1988. From 1985 through 1987, 608 Polar Bears were captured and studied with no handling deaths. Using several approaches, population estimates



ranged between 1300 and 2100 which were similar to those of the 1970's. Negative effects of development, or of increased hunting pressure, were not detected.

Field studies on the mortality rates of cub and subadult Polar Bears began in northwestern Manitoba in the fall of 1987. Three hundred and eight Polar Bears were captured, and in the spring of 1988, 40 family groups and one lone female (total 114 bears) were captured coming out of the Churchill denning area. The results obtained in western Hudson Bay will be compared with those from the eastern Beaufort Sea to get some measure of geographic variability.

Studies of the influence on Polar Bears of ice conditions, of seal distribution and abundance, and of the importance of polynyas continued at Dundas Island from mid-February to mid-May, 1988. Five of the seven walruses branded in 1987 were resighted within a few kilometers of where they were first tagged, indicating strong seasonal fidelity to the polynya area.

The National Computerized Data Base continue to be maintained and now has over 19,000 records. It is currently held on the University of Alberta computer and other agencies have access to extractions of material on request.

Wood Bison

The CWS coordinates a cooperative national program to reintroduce free-roaming Wood Bison into areas of former range in northwestern Canada. During 1987/88, the status of Wood Bison herds currently being held in enclosures in Alberta, Manitoba and the Yukon was monitored. During summer 1987 in Alberta, Manitoba and the Yukon, 9, 4 and 1 calves, respectively, were born on site at each of the corral locations.

Total herd size in the Hay-Zama enclosure is 42. The first release of bison from this site was planned for 1986, but was postponed because of problems with reproduction. More recently, the potential for disease contamination of released animals has caused an indefinite delay in release of animals at this site.

Transfer of wood bison from Elk Island National Park, Moose Jaw Wild Animal Park, and Banff National Park to Manitoba has increased the herd size at Waterhen to 162. The arrival of eight new calves in the herd this spring indicated new management measures have been successful. The first release of 15 of these animals has been scheduled for June, 1988. Once a wild herd is successfully established, the Waterhen Indian Band will be developing a commercial Wood Bison ranch in the enclosure.

In the Yukon, the first release of 23 Wood Bison occurred on March 1988, leaving a captive herd of 20 in the enclosure. The birth of one calf in the released herd and three more in their captive herd is a positive start to the 1988 calving season.

Total numbers of Wood Bison have increased steadily from less than 200 in 1959, to 450 in 1978, to more than 2200 in 1987. This increase has recently resulted in the down-listing of the species from endangered to threatened by the Committee on the Status of Endangered wildlife in Canada (COSEWIC).

Barren-Ground Caribou

A study of the effects of fire on the winter range of the Beverly Herd of caribou was undertaken by the Canadian Wildlife Service and completed in 1987. Analyses of the data are now nearly completed. The results indicated that there is sufficient winter range to maintain the present herd of 300,000 animals. The herd has widened its range in recent years and now travels from Nueltin Lake on the Manitoba/NWT border to near Yellowknife. The results of the study will be used to establish priority zones for fire control if caribou managers wish to increase herd size.

Woodland Caribou

Special attention will be given to the rare Woodland Caribou in western Canada beginning in 1988. The first step is to coordinate a review of known populations and their status. That will be followed by an identification of data gaps and steps necessary to learn more about these vulnerable animals.

Duck Biology

Studies of homing, nest-site selection, fall residency and population regulation in upland-nesting ducks continued at the St. Denis National Wildlife Area, Saskatchewan, in 1987. Preliminary information suggested that mallards responded favourably to reduced nest predation in 1986. Complementary studies of mallard incubation behaviour and American crow breeding biology are continuing.

Goose Research

An experimental goose nesting habitat survey, in cooperation with the U.S. Fish and Wildlife Service, was carried out in the Arctic from the Mackenzie Delta to Baffin Island. With Inuvialiut help, over 2000 Snow Geese were banded at Kendall Island, Anderson River and Banks Island Migratory Bird Sanctuaries, to allow determination of the degree of mixing of Snow Geese from the three colonies and the populations that winter in California or Mexico and New Mexico. A study of the effect of aerial and marine disturbance on arctic geese and swans was completed, with field work on Brant and White-fronted Geese, to develop guidelines for industry to reduce disturbance to breeding waterfowl in the Beaufort Sea-Mackenzie Delta region.

Shorebird Surveys

Canada, U.S.A. and various countries in South and Central America are presently developing a proposal to create a hemisphere-wide system of reserves for shorebird conservation. As part of this program, aerial shorebird surveys were conducted in 1987 throughout the southern half of the three prairie provinces. These surveys attempted to define the number of shorebirds using the prairies during spring and fall migration, and to identify major staging areas.

As an extension of the International Shorebird Survey Program, a volunteer network of ground data collectors was created in 1987. Preliminary results from aerial surveys show that two sites in southern Saskatchewan are worthy of Hemisphere Reserve Status (250,000 birds or 30% of flyway population), and at least four other sites merit Regional Reserve Status (20,000 birds or more), two in Alberta and one each in Manitoba and Saskatchewan.

A third year of field work to identify nesting habitats of shorebirds in the Mackenzie River Delta, using Landsat Thematic Mapper imagery, was successfully concluded.

Whooping Crane Migration

A 24-hour Whooping Crane reporting system for sightings from the public, conservation officers and others was established. Sight evaluations were completed for the spring and fall migration. These sightings were tabulated and added to a Whooping Crane data base. In addition, data on foraging and roosting habitat was collected this past field season.

Lead Shot Studies

Information on the incidence of lead poisoning in waterfowl in western Canada continued to be gathered, with a view to formulating a program to alleviate lead poisoning problems.

Loggerhead Shrike Conservation

A project was initiated to evaluate the status and distribution of this threatened bird in the prairie provinces. A study in 1987 was jointly funded by CWS and the World Wildlife fund with the support of the wildlife agencies of Alberta, Saskatchewan and Manitoba. Surveys were conducted which delineated the breeding distribution and relative density of breeding pairs in the three provinces and a preliminary draft of an action plan prepared.

Remote Sensing

CWS continued to test the applications of LANDSAT satellite imagery to wildlife uses. Fieldwork and contracts with Ecosat Geobotanical Services Limited demonstrated the usefulness of LANDSAT Thematic Mapper imagery to pin-pointing nesting habitat for shorebirds in the Mackenzie Delta area of the Northwest Territories.

Inuvialuit Settlement Region (ISR)

Migratory Bird Studies Section completed a major review of past and current status of duck, goose, crane and swan populations in the ISR and adjacent Alaska and Central Arctic regions. The report addresses information needs of the Inuvialuit Final Agreement of 1984 in regard to subsistence harvest allocations. A condensed summary report is in preparation.

North American Waterfowl Management Plan

Staff of Migratory Bird Studies Section participated in a review of status of three subpopulations of common eiders that migrate, breed, brood and molt in Western and Northern Region (W&NR). A co-operative banding and marking venture will be initiated on Low Arctic stocks for summers 1989 to 1991 in W&NR. A proposal for a Joint Venture Eider Working Group with Greenland and United States remains in the formative stages.

MBSS staff continue to participate in meetings of an ad hoc technical committee of the Arctic Goose Joint Venture (AGJV), primarily involved in problem identification and priorization of issues. The focus has been narrowed to 12 populations of geese. Some 25 goose related projects are now underway in Alaska and Arctic Canada. The AGJV will be formalized between Canada and the United States during the summer and fall of 1988.

Toxic Chemicals Monitoring

A collaborative study of the effects of carbofuran spraying on prairie songbirds and small mammals was carried out by CWS, the University of Saskatchewan and Agriculture Canada. A study of effects of grasshopper spraying on Loggerhead Shrike reproduction resulted in extensive data on reproductive success and growth but no data on use of insecticides, because very little spraying occurred. The effects of carbofuran on ducklings will be examined through a contract with the University of Manitoba. Other projects are being planned to address concerns about contamination of wetlands with deltamethrin insecticide and effects of herbicides on waterfowl habitat.

Trumpeter Swans

Surveys of the N.W.T. flock continued in 1987. Ninety-six Trumpeter Swans (53 adults and 43 cygnets) were collared and banded. Information on migration routes and wintering habitat use is now being collected through the cooperation of observers throughout Canada and the USA. Preliminary observations indicate the N.W.T. flock is not only pioneering new breeding areas, but may also be selecting new wintering sites in the USA.

As a Wildlife '87 project, Canadian Wildlife Service and Parks Canada initiated a three-year cooperative Trumpeter Swan transplant to Elk Island National Park, Alberta. In July of 1987, four family groups, eight adults and 18 cygnets were captured from the Grande Prairie, Alberta flock, transported to and released on wetlands at Elk Island National Park. Fall migration monitoring indicated that eight adults and five cygnets left Elk Island and have migrated to traditional wintering areas near Yellowstone National Park, USA. Elk Island will be monitored during spring migration in anticipation of the return of transplant cygnets.

North American Waterfowl Management Plan

In cooperation with other agencies, CWS assisted in the development of the Manitoba and Alberta Provincial Implementation Plans; plan preparation for the first-step projects in Saskachewan and Alberta; and in the implementation and evaluation of the Prairie Pothole Pilot Project at Redvers, Saskatchewan. The Pilot Project evaluation assessed the overall impact of habitat treatments on duck populations.

As well CWS initiated a long-term cooperative project at Redvers, Saskatchewan to measure the efficiency of conservation grazing techniques in providing safe nesting cover for waterfowl. The study will compare nest success of upland-nesting ducks under continuous grazing and deferred rotation grazing.

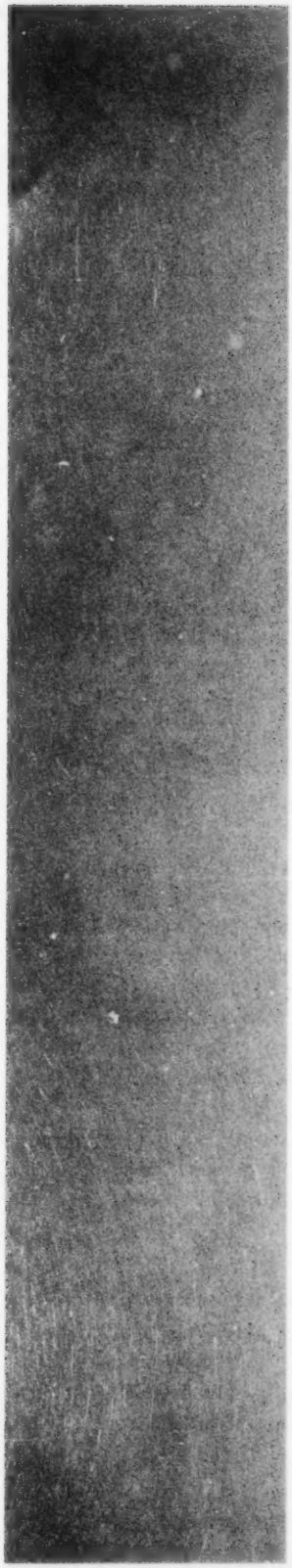
The Prairie Habitat Monitoring Project measures the type and magnitude of changes occurring in the migratory bird habitat base in the settled portions of the Prairie Provinces. The results of the study will demonstrate the extent and severity of habitat loss in different habitat zones.

Beaufort Sea Bird Monitoring

The third year of a program to monitor the effects of offshore oil and gas production on birds in the Beaufort Sea region has been completed. The annual productivity of the Red-throated Loon is being used as the indicator of impacts. Five years of data prior to any major development will be gathered to determine the natural annual fluctuations in the productivity of the loon. This data will provide a benchmark for comparison once a major oil and gas development has occurred.

Wildlife '87

Wildlife '87 was highlighted at Last Mountain Lake in June when a Federal-Provincial Agreement was signed by the Honourable Tom McMillan and by John Maxwell, Minister of Saskatchewan



Parks, Recreation and Culture to designate Last Mountain Lake as a National Wildlife Area. The Agreement was witnessed by His Royal Highness, Prince Phillip, Duke of Edinburgh.

Population Management and Enforcement

A significant reduction (-35%) in the number of May ponds in prairie Canada was recorded in 1987 compared to 1986, and the number of ponds in 1987 was also well below (-19%) the average of the 10 previous years. Agricultural practices continue to impact many wetland basins and most wetland margins. Although total duck populations were slightly larger (+8%) in 1987 compared to 1986 in prairie Canada, numbers were still below (-10%) the 10-year average.

Restrictive hunting regulations were in effect once again in 1987 in the provinces of Manitoba, Saskatchewan and Alberta to achieve a harvest of Mallards 25% less than what would have occurred under the Stable Regulations Period.

The Population Management Section continues to provide waterfowl and habitat monitoring services for the annual estimate of national and continental waterfowl populations, in cooperation with the United States Fish and Wildlife Service. The Population Management Section is also active in the continued formation of the Arctic Goose Joint Venture, and is participating in three pilot banding and neck-collaring programs in the western and eastern Arctic. Annual duck banding at various sites in the southern prairie regions continue to provide estimates of annual survival.

Northern Operations:

a) Polar Bear Pass National Wildlife Area (NWA)

The agreement relating to "The Cooperative Management of Wildlife of Polar Bear Pass NWA" has been completed. An Area Advisory Committee has been established and is presently preparing the first draft of the Area management plan. The draft plan should be available for public review in 1988.

b) Proposed Migratory Bird Sanctuaries

Discussions on the establishment of Prince Leopold Island, Cape Searle and Reid Bay as sanctuaries are continuing. Tungavik Federation of Nunavut has indicated that they will support the decision of the communities regarding the sanctuaries. Resolute Hunters and Trappers Association confirmed that they support the designation of Prince Leopold Island.

For Further Information

Conservation and Protection

Bev Burns
Regional Director General
Conservation and Protection
Western & Northern Region
2nd Floor, Twin Atria #2
4999 - 98 Avenue
Edmonton, Alberta
T6B 2X3 (403) 468-8065

Bill Brakel
Conservation and
Protection Secretariate
Western & Northern Region
2nd Floor, Twin Atria #2
4999 - 98 Avenue
Edmonton, Alberta
T6B 2X3 (403) 468-8062

Nick Tywoniuk
C.O.R.E. Secretariate
Conservation & Protection
Western & Northern Region
2nd Floor, Twin Atria #2
4999 - 98 Avenue
Edmonton, Alberta
T6B 2X3 (403) 468-8063

Canadian Wildlife Service

Gordon Kerr
Regional Director
2nd Floor, Twin Atria #2
4999 - 98 Avenue
Edmonton, Alberta
T6B 2X3 (403) 468-8065

Dale Caswell
Winnipeg District Office
501 University Crescent
Winnipeg, Manitoba
T3T 2N6 (204) 983-5260

Tony Diamond
Officer-in-Charge
Saskatoon District Office
115 Perimeter Road
Saskatoon, Saskatchewan
S7N 0X4 (306) 975-4087

Kevin McCormick
Officer-in-Charge
Yellowknife District Office
P.O. Box 637
Yellowknife, N.W.T.
X1A 2N5 (403) 920-8531

Environmental Protection

Robert Lane
Regional Director
Western and Northern Region
2nd Floor, Twin Atria #2
4999 - 98 Avenue
Edmonton, Alberta
T6B 2X3 (403) 468-8041

Peter Blackall
Manager
Scientific Programs Branch
Edmonton, Alberta (403)
468-8025

Gordon Manners
A/Manager
Alberta District Office
2nd Floor, Twin Atria #2
4999 - 98 Avenue
Edmonton, Alberta
T6B 2X3 (403) 468-8007

Margaret Ault Brakel
Manager
Environmental
Quality Branch
Edmonton, Alberta
(403) 468-8018

John Witteman
Manager
Saskatchewan District Office
2nd Floor, 1901 Victoria
Avenue
Regina, Saskatchewan
S4P 3R4 (306) 780-6464

Barry Briscoe
Manager
Manitoba District Office
521-269 Main Street
Winnipeg, Manitoba
R3C 1B2 (204) 983-4811

Scott Howarth
A/Manager
N.W.T. District Office
9th Floor, Bellanca Building
Box 370
Yellowknife, N.W.T.
X1A 2N3 (403) 873-3456

Inland Waters

Bob Halliday
Regional Director
Western and Northern Region
Main Floor, 1901 Victoria
Avenue
Regina, Saskatchewan
S4P 3R4 (305) 780-5319

Bill Gummer
Water Quality Branch
Regina, Saskatchewan
(306) 780-5322

Derek Bjonback
Water Planning and
Management
Regina, Saskatchewan
(306) 780-5326

Russell Boals
Water Resources Branch
210, 1102 - 8th Avenue
Regina, Saskatchewan
S4R 1C9 (306) 780-5338

Gerry Morton
Alberta District Office
854 - 220 - 4th Avenue, S.E.
Calgary, Alberta
T2P 2M7 (403) 292-5311

Bob Hale
Manitoba District Office
521 - 269 Main Street
Winnipeg, Manitoba
R3C 1B2 (204) 983-7174

Arthur Redshaw
N.W.T. District Office
9th Floor, Bellanca Bldg.
Box 370
Yellowknife, N.W.T.
X1A 2N3 (403) 920-8500

Milne Dick
Director
National Hydrology
Research Centre
11 Innovation Blvd.
Saskatoon, Saskatchewan
S7N 3H5 (306) 975-5718